

# The Prevalence of Symptomatic Vaginal Candidiasis Among Females in Tehran, 2014

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Received 2015 November 13; Revised 2016 March 01; Accepted 2016 March 07.

## Abstract

**Background:** Vaginitis is the most common gynecological problem and the second most common infection. This condition occurs in approximately 90% of the affected females; secondary to bacterial vaginosis and vulvovaginal candidiasis.

**Objectives:** According to the high prevalence of vulvovaginal candidiasis in Iran and because of the importance of controlling causing species, the current study aimed to evaluate the prevalence of symptomatic vaginal candidiasis among females referred to the hospitals affiliated to Shahid Beheshti University in Tehran, Iran in 2014.

**Patients and Methods:** In this cross-sectional study, 580 females suspected of vulvovaginal candidiasis were selected by simple random sampling. In lithotomy position and after using sterile speculum without lubrication a fluid sample was obtained from the upper part of the lateral wall of the vagina and the samples were cultured on agar medium. All samples were examined by the same gynecologist.

**Results:** The prevalence of vaginal candidiasis was 15.5% and *Candida albicans* was observed in 92.3% of the subjects.

**Conclusions:** *Candida albicans* was the most common cause of vaginal candidiasis.

**Keywords:** Prevalence, Vaginal Candidiasis, *Candida albicans*

## 1. Background

Vaginitis is the most common gynecological problem and the second most common infection (1-3). This condition occurs in approximately 90% of affected females; secondary to bacterial vaginosis and vulvovaginal candidiasis (4). Seventy five percent of females experience vulvovaginal candidiasis at least once in their life (5, 6).

*Candida albicans* is the most common cause of mycotic vaginitis in 80% -90% of symptomatic cases (7). Tendency to relapse and the difficulty to control the recurrent infection make infection caused by these fungi a serious problem (8).

It seems that hormones have a prominent role in candidiasis, because the infection is observed before menarche and rarely after menopause (9) and the highest incidence of the disease occurs in females aged 25-35 years. Studies reported the high the prevalence of vulvovaginal candidiasis in Iran (10). But there is no study on the prevalence of various forms of the disease in this region.

## 2. Objectives

The current study aimed to assess the prevalence of vaginitis in females referred to the hospitals affiliated to Shahid Beheshti University in Tehran, Iran in 2014.

## 3. Patients and Methods

This cross-sectional study was conducted in the hospitals affiliated to Shahid Beheshti University in Tehran, Iran, in 2014. After receiving the ethics approval and patients' informed consent, 580 females with itching, abnormal vaginal secretion and one of the following symptoms were selected by simple random sampling: dysuria, pH < 5.4, dyspareunia, vulvar erythema. Patients were enrolled in the study based on positive dextrose agar testing result. Patients aged 18 - 45 years, one sexual partner, vulvovaginal candidiasis confirmed by clinical symptoms and positive KOH testing result were recruited. Females with pregnancy, history of vaginal medication, using antibiotics and immunosuppressive drugs, use of exogenous hormones included oral contraceptives within two weeks before the

evaluation, vaginal intercourse in the last 24 hours, diabetes and autoimmune disease were excluded from the study.

For sampling, patients were placed in lithotomy position and after using sterile speculum without lubrication, a fluid sample was obtained from the upper part of the lateral wall of the vagina and placed on two slides and one cultured on agar media. All samples were examined by the same gynecologist. Samples were evaluated for *Candida* spp. One to two drops of saline were added to the first smear samples. Samples were excluded if there was a trichomoniasis flagellated parasite. One drop of KOH 10% was added to the second smear samples and the samples were examined for *Candida* hyphae and amine odor. In the case of bacterial vaginosis, the sample was excluded. Germ tube test (germ tube) was used to identify *Candida albicans*. One milliliter of healthy human blood serum was added to the isolated yeasts, incubated at 37°C and after 30, 60, 90 and 120 minutes the samples were examined under a microscope to evaluate the creation of germ tube. Yeast capable of forming a germ tube was considered positive. Results were divided into two groups of *Candida albicans* and non-*albicans Candida* spp.

### 3.1. Statistical Analysis

Data were analyzed using statistical package for social sciences (SPSS) version 16 (SPSS Inc. Chicago, IL) for windows. Chi-Square and Student-T-test were used. A P-value < 0.05 was considered statistically significant.

## 4. Results

Eventually, 580 cases with the mean age of  $30.42 \pm 5.04$  years underwent the analysis. Of the total 580 cases, vaginal candidiasis was observed in 90 subjects. According to the obtained results, prevalence of vaginal candidiasis was 15.5%. *Candida albicans* was observed in 92.3% of patients with vaginal candidiasis. Also, results showed that 41.1% of subjects used condoms and 26.6% used intrauterine devices to prevent pregnancy.

## 5. Discussion

In the present study, the prevalence of vaginal candidiasis was reported 15.5%. It was also observed that 92.3% of the subjects had *Candida albicans* vaginitis versus 7.7% who had non-*albicans* infection. It should be mentioned that the current study evaluated the prevalence of vaginal candidiasis in some hospitals in Tehran, Iran, and reported the rate of *Candida albicans* vaginitis; therefore, the prevalence of vaginal candidiasis was so low in the recent study.

Gavvani et al. (8) reported the prevalence of vaginal candidiasis as 25.2%. This rate was 15.5% in the current study. According to Aalei et al. (10) the prevalence of vaginal candidiasis was 19.8%. In the current study, the prevalence was lower than these two studies. It seems that the prevalence of vaginal candidiasis is related to health, socio-cultural factors and because of higher health and social level in Tehran, the prevalence of vaginal candidiasis is lower than other areas of the country.

Fouladvand et al. (11) showed that in 87.3% of subjects, *Candida albicans* was the cause of vaginal candidiasis. This finding confirmed the current study results.

Sobel et al. (12) concluded that *Candida albicans* was responsible for 80% - 92% of vulvovaginal candidiasis.

### 5.1. Conclusion

It was concluded that the prevalence of vaginal candidiasis was 15.5% in Tehran, Iran, and *Candida albicans* was the most common pathogen in vaginal candidiasis. Finally it was recommended that more studies should be conducted on the factors of vaginitis in other regions with health and cultural differences.

## Footnotes

**Authors' Contribution:** All authors contributed equally in this project.

**Financial Disclosure:** There was no financial disclosure.

**Funding/Support:** There was no financial and material support for the research.

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